

FIG. 1

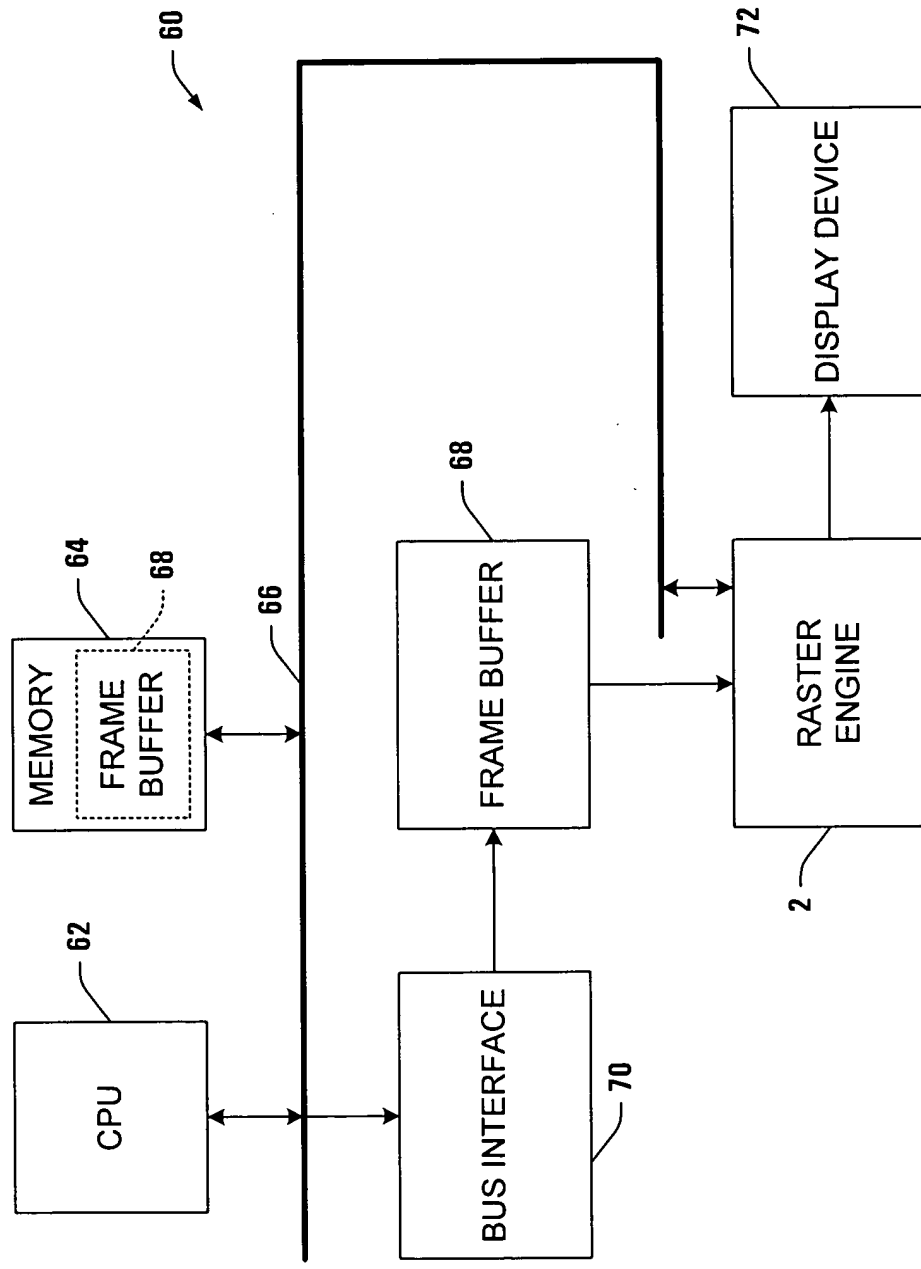


FIG. 2A

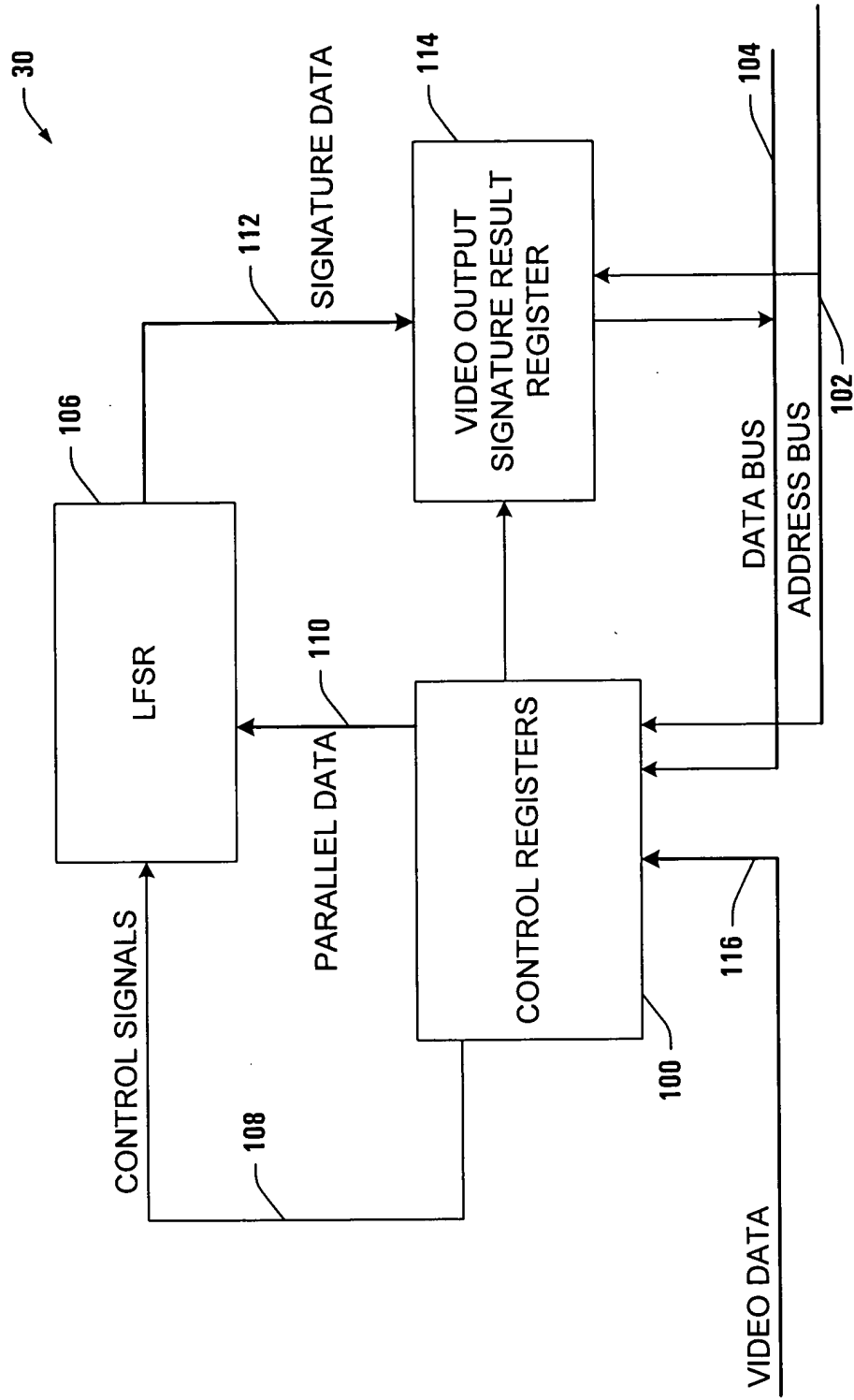


FIG. 3

FIG. 4

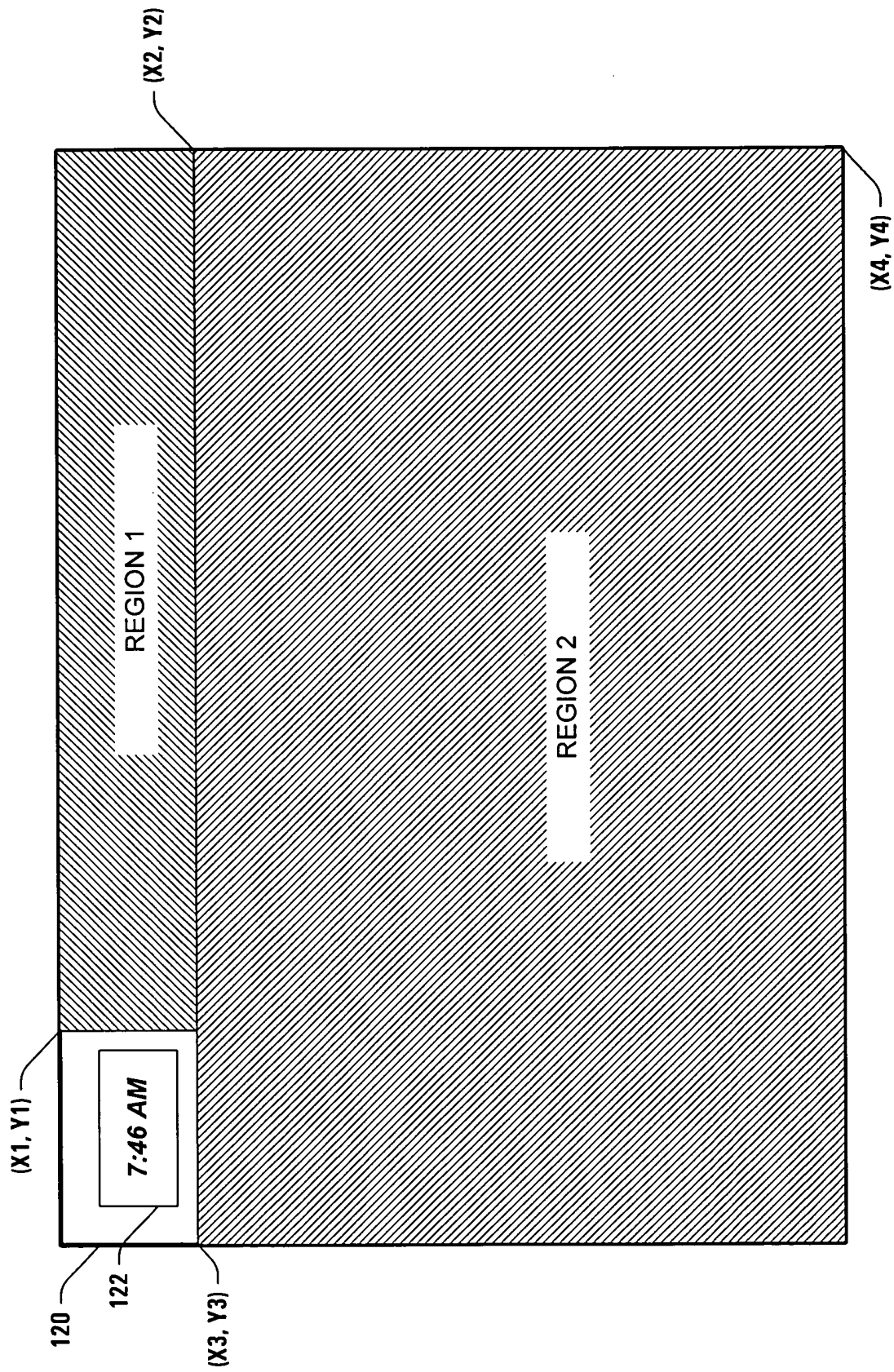


FIG. 5

[illegible][illegible]

SIGNAL

FIG. 6A

130

31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16
EN	RSVD	SPCLK	BRIGHT	CLKEN	BLANK	HSYNC	VSYNC	PEN	PEN	PEN	PEN	PEN	PEN	PEN	PEN

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
PEN	PEN	PEN	PEN	PEN	PEN	PEN	PEN	PEN	PEN	PEN	PEN	PEN	PEN	PEN	PEN

SIGCTL

FIG. 6B

132

31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16
RSVD	RSVD	RSVD	RSVD	RSVD	STOP ₁₀	STOP ₉	STOP ₈	STOP ₇	STOP ₆	STOP ₅	STOP ₄	STOP ₃	STOP ₂	STOP ₁	STOP ₀

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
RSVD	RSVD	RSVD	RSVD	RSVD	STOP ₁₀	START ₉	START ₈	START ₇	START ₆	START ₅	START ₄	START ₃	START ₂	START ₁	START ₀

VSIGSTRTSTOP

FIG. 6C

134

31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16
RSVD	RSVD	RSVD	RSVD	RSVD	STOP ₁₀	STOP ₉	STOP ₈	STOP ₇	STOP ₆	STOP ₅	STOP ₄	STOP ₃	STOP ₂	STOP ₁	STOP ₀

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
RSVD	RSVD	RSVD	RSVD	RSVD	START ₁₀	START ₉	START ₈	START ₇	START ₆	START ₅	START ₄	START ₃	START ₂	START ₁	START ₀

HSIGSTRTSTOP

136

FIG. 6D

31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16
RSVD	RSVD	RSVD	RSVD	RSVD	VCLR ₁₀	VCLR ₉	VCLR ₈	VCLR ₇	VCLR ₆	VCLR ₅	VCLR ₄	VCLR ₃	VCLR ₂	VCLR ₁	VCLR ₀

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
RSVD	RSVD	RSVD	RSVD	RSVD	HCLR ₁₀	HCLR ₉	HCLR ₈	HCLR ₇	HCLR ₆	HCLR ₅	HCLR ₄	HCLR ₃	HCLR ₂	HCLR ₁	HCLR ₀

SIGCLR

138

FIG. 6E

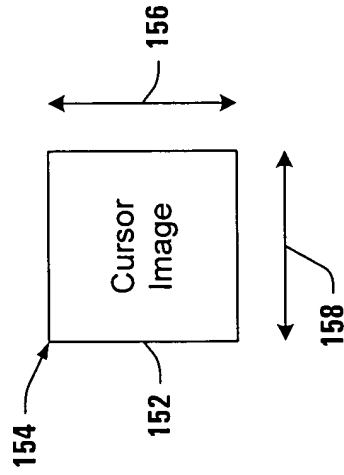


FIG. 7A

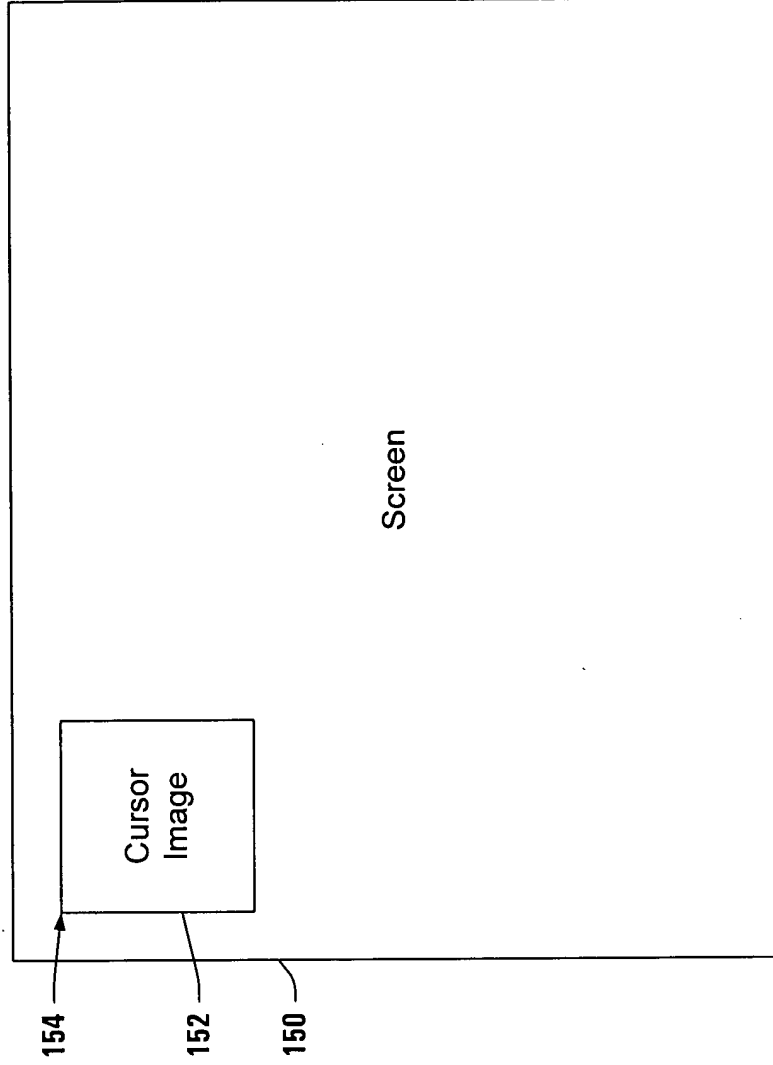


FIG. 7B

160

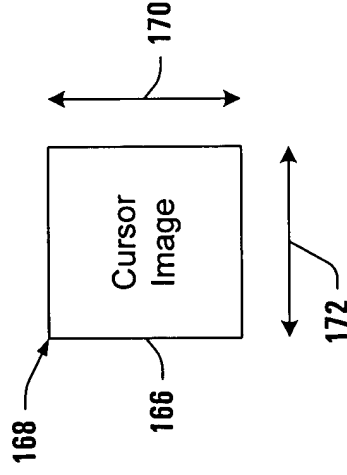
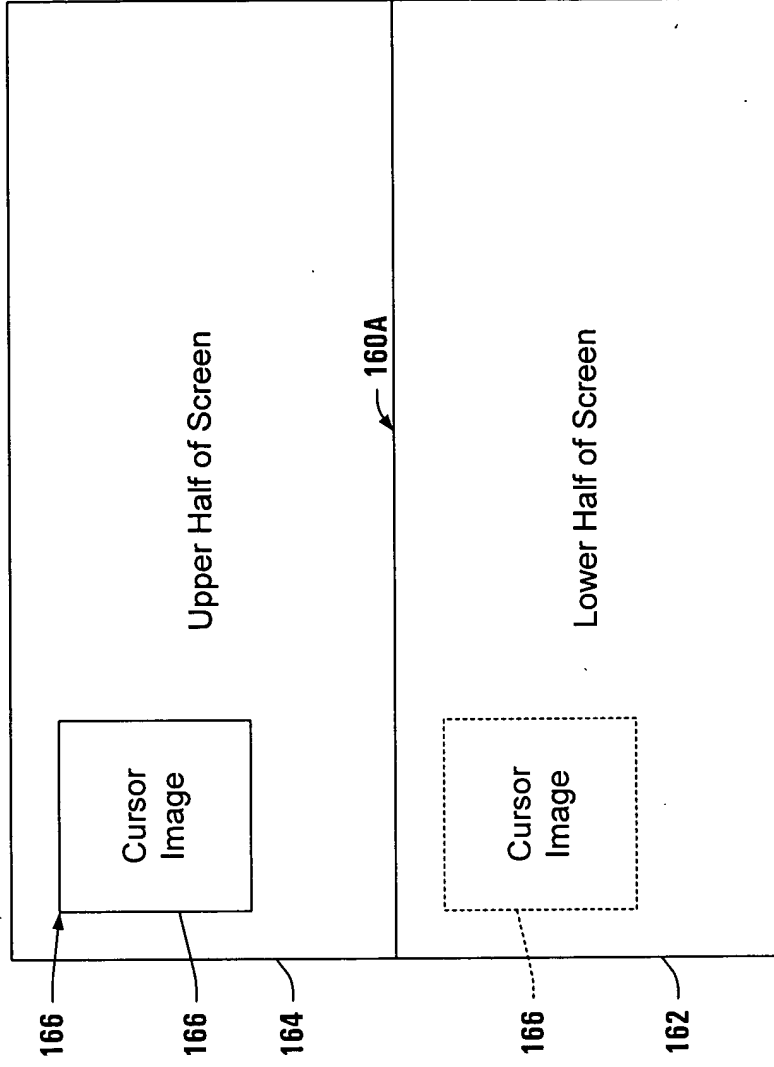


FIG. 8A

FIG. 8B

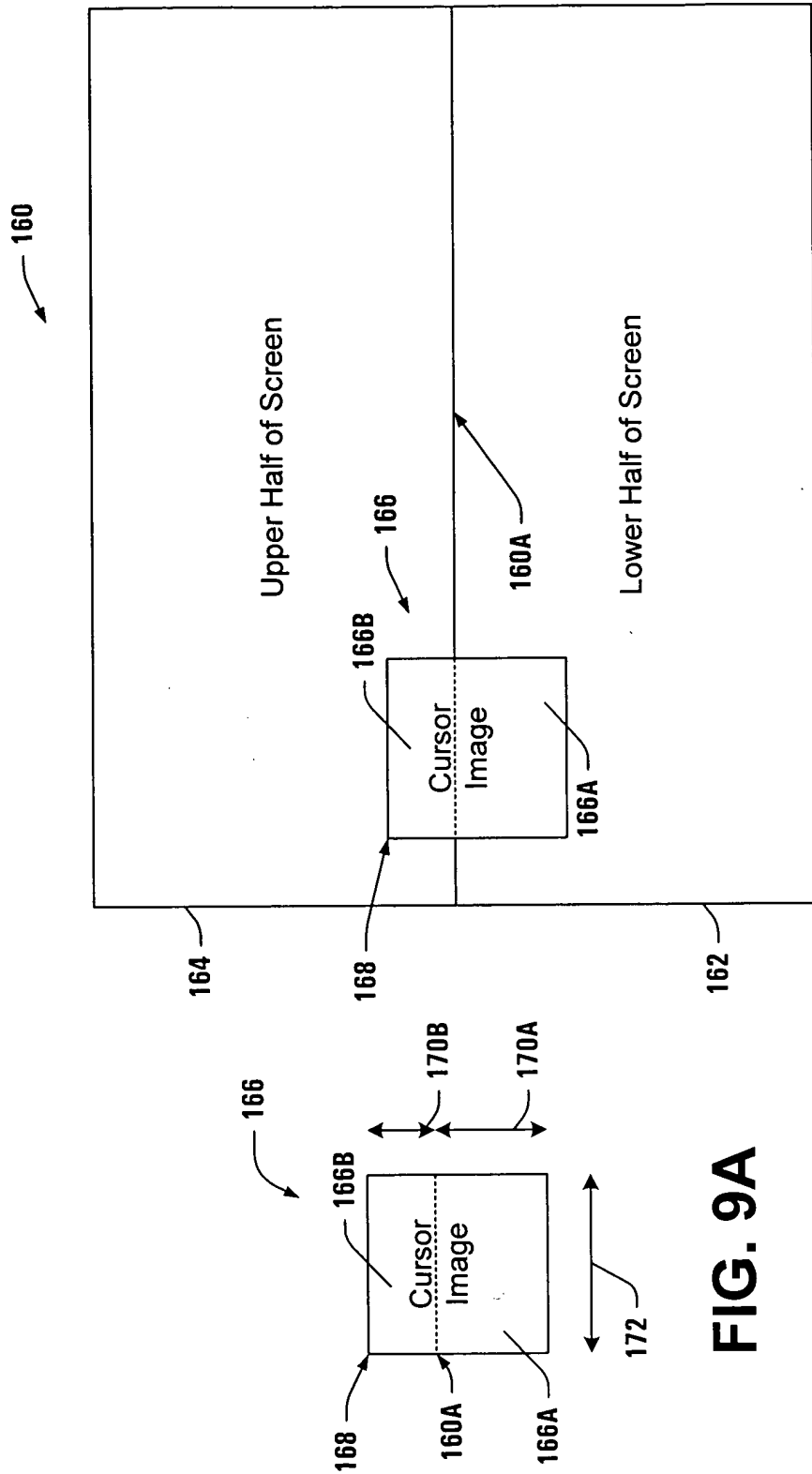


FIG. 9A

FIG. 9B

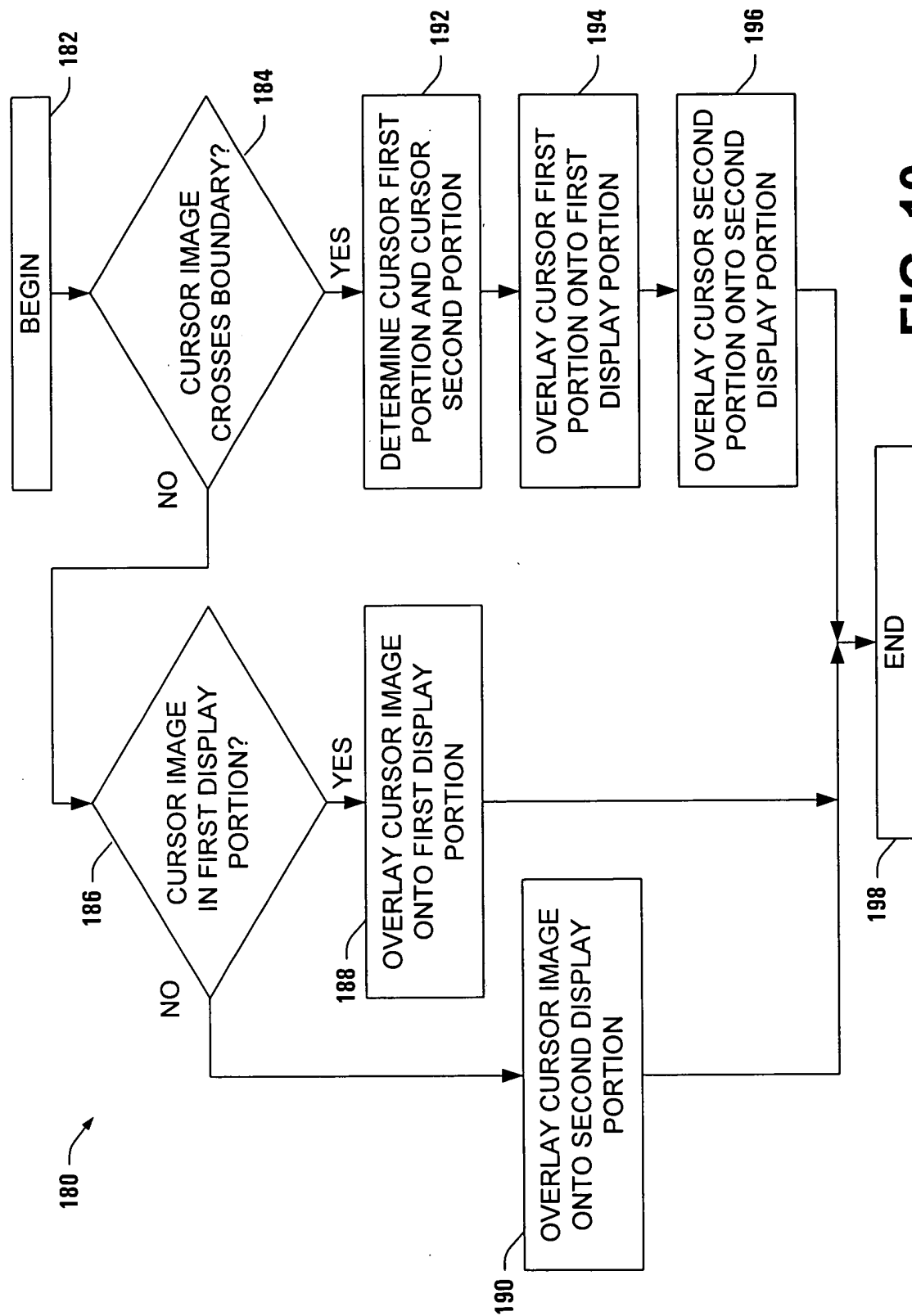


FIG. 10

[illegible][illegible][illegible]

CURSOR_ADR_START

FIG. 11A

200

[illegible][illegible]

CURSOR_ADR_RESET

FIG. 11B

202

31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16
RSVD	RSVD	RSVD	RSVD	RSVD	RSVD	RSVD	RSVD	RSVD	RSVD	RSVD	RSVD	RSVD	RSVD	RSVD	RSVD

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
DLNS5	DLNS4	DLNS3	DLNS2	DLNS1	DLNS0	CSTEP 1	CSTEP 0	CLINS5	CLINS4	CLINS3	CLINS2	CLINS1	CLINS0	CWID1	CWID0

CURSORSIZE

204

FIG. 11C

31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16
RSVD	RSVD	RSVD	RSVD	RSVD	RSVD	RSVD	RSVD	COLO R	COLO R	COLO R	COLO R	COLO R	COLO R	COLO R	COLO R

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
COLO R	COLO R	COLO R	COLO R	COLO R	COLO R	COLO R	COLO R	COLO R	COLO R	COLO R	COLO R	COLO R	COLO R	COLO R	COLO R

CURSORCOLOR1
CURSORCOLOR2
CURSORBLINK1
CURSORBLINK2

206

FIG. 11D

31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16
RSVD	RSVD	RSVD	RSVD	RSVD	YLOC ₁₀	YLOC ₉	YLOC ₈	YLOC ₇	YLOC ₆	YLOC ₅	YLOC ₄	YLOC ₃	YLOC ₂	YLOC ₁	YLOC ₀

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
CEN	RSVD	RSVD	RSVD	RSVD	XLOC ₁₀	XLOC ₉	XLOC ₈	XLOC ₇	XLOC ₆	XLOC ₅	XLOC ₄	XLOC ₃	XLOC ₂	XLOC ₁	XLOC ₀

CURSORYLOC

208

FIG. 11E

31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16
RSVD	RSVD	RSVD	RSVD	RSVD	RSVD	RSVD	RSVD	RSVD	RSVD	RSVD	RSVD	RSVD	RSVD	RSVD	RSVD

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
CLHEN	RSVD	RSVD	RSVD	RSVD	YLOC ₁₀	YLOC ₉	YLOC ₈	YLOC ₇	YLOC ₆	YLOC ₅	YLOC ₄	YLOC ₃	YLOC ₂	YLOC ₁	YLOC ₀

CURSOR_DHSCAN_LH_YLOC

210

FIG. 11F

31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16
RSVD	RSVD	RSVD	RSVD	RSVD	RSVD	RSVD	RSVD	RSVD	RSVD	RSVD	RSVD	RSVD	RSVD	RSVD	RSVD

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
RSVD	RSVD	RSVD	RSVD	RSVD	RSVD	RSVD	EN	RATE	RATE	RATE	RATE	RATE	RATE	RATE	RATE

CURSORKLINK

212

FIG. 11G



FIG. 12

shift mode	color mode	output mode	P(23)	P(22)	P(21)	P(20)	P(19)	P(18)	P(17)	P(16)	P(15)	P(14)	P(13)	P(12)	P(11)	P(10)	P(9)	P(8)	P(7)	P(6)	P(5)	P(4)	P(3)	P(2)	P(1)	P(0)
0x0	0x4	single pixel per clock up to 24 bits wide	P(23)	P(22)	P(21)	P(20)	P(19)	P(18)	P(17)	P(16)	P(15)	P(14)	P(13)	P(12)	P(11)	P(10)	P(9)	P(8)	P(7)	P(6)	P(5) B(5)	P(4) B(4)	P(3)	P(2)	P(1)	P(0)
0x0	0x8		R(7)	R(6)	R(5)	R(4)	R(3)	R(2)	R(1)	R(0)	G(7)	G(6)	G(5)	G(4)	G(3)	G(2)	G(1)	G(0)	B(7)	B(6)			B(3)	B(2)	B(1)	B(0)
0x0	0x5	single 16-bit 565 pixel per clock	R(4)	R(3)	R(2)	R(1)	R(0)	R(4)	R(3)	R(2)	G(5)	G(4)	G(3)	G(2)	G(1)	G(0)	G(5)	G(4)	B(4)	B(3)	B(2)	B(1)	B(0)	B(4)	B(3)	B(2)
0x0	0x6	single 16-bit 555 pixel per clock	R(4)	R(3)	R(2)	R(1)	R(0)	R(4)	R(3)	R(2)	G(4)	G(3)	G(2)	G(1)	G(0)	G(4)	G(3)	G(2)	B(4)	B(3)	B(2)	B(1)	B(0)	B(4)	B(3)	B(2)
0x1	0x0 0x4	single 24 bit pixel on 18 lines	X	X	X	X	X	X	R(7)	R(6)	R(5)	R(4)	R(3)	R(2)	G(7)	G(6)	G(5)	G(4)	G(3)	G(2)	G(1)	G(0)	B(5)	B(4)	B(3)	B(2)
0x1	0x8		X	X	X	X	X	X	R(4)	R(3)	R(2)	R(1)	R(0)	R(4)	G(5)	G(4)	G(3)	G(2)	G(1)	G(0)	B(4)	B(3)	B(2)	B(1)	B(0)	B(4)
0x1	0x5	single 16-bit 565 pixel on 18 lines	X	X	X	X	X	X	R(4)	R(3)	R(2)	R(1)	R(0)	R(4)	G(4)	G(3)	G(2)	G(1)	G(0)	G(4)	B(4)	B(3)	B(2)	B(1)	B(0)	B(4)
0x1	0x6	single 16-bit 555 pixel on 18 lines	X	X	X	X	X	X	R(4)	R(3)	R(2)	R(1)	R(0)	R(4)	G(4)	G(3)	G(2)	G(1)	G(0)	G(4)	B(4)	B(3)	B(2)	B(1)	B(0)	B(4)
0x2	0x0	progressive scan	P(20)	P(12)	P(4)	P(0)	P(0)	P(0)	P(0)	P(0)	P(0)	P(0)	P(0)	P(0)	P(0)	P(0)	P(0)	P(0)	P(0)	P(0)	P(0)	P(0)	P(0)	P(0)	P(0)	P(0)
0x8	0x8	2 pixels per shift clock dual scan	R(4) *	G(4) *	B(4) *	R(4) *	G(4) *	B(4) *	R(4) *	G(4) *	B(4) *	R(4) *	G(4) *	B(4) *	R(4) *	G(4) *	B(4) *	R(4) *	G(4) *	B(4) *	R(4) *	G(4) *	B(4) *	R(4) *	G(4) *	B(4) *
0x3	0x0	progressive scan	P(14)	P(6)	P(2)	P(0)	P(0)	P(0)	P(0)	P(0)	P(0)	P(0)	P(0)	P(0)	P(0)	P(0)	P(0)	P(0)	P(0)	P(0)	P(0)	P(0)	P(0)	P(0)	P(0)	P(0)
0x8	0x8	4 pixels per shift clock dual scan	G(6) *	B(6) *	B(6) *	B(6) *	G(6) *	B(6) *	G(6) *	B(6) *	G(6) *	B(6) *	G(6) *	B(6) *	G(6) *	B(6) *	G(6) *	B(6) *	G(6) *	B(6) *	G(6) *	B(6) *	G(6) *	B(6) *	G(6) *	B(6) *

FIG. 14A

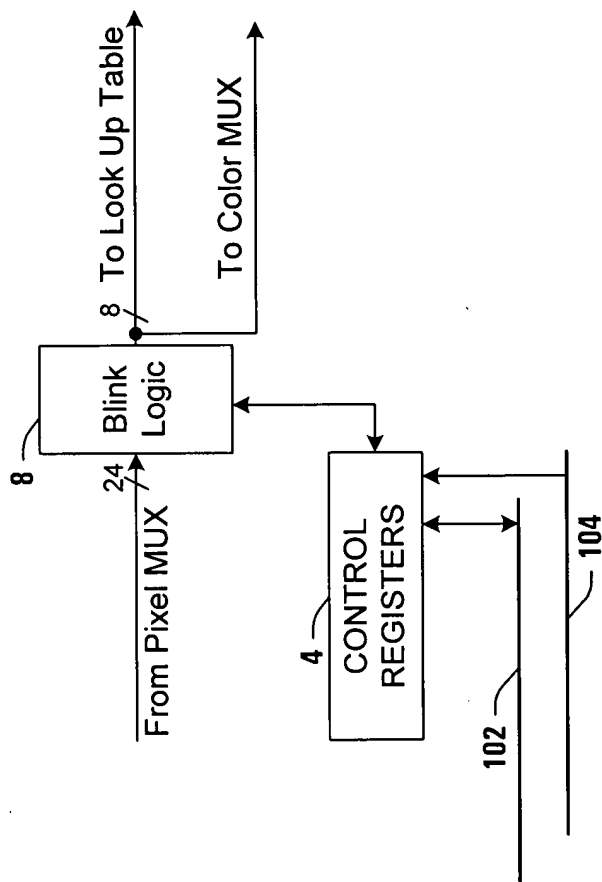


FIG. 15

[illegible][illegible][illegible]

BLINKRATE

FIG. 16A

250

[illegible][illegible]

BLINKMASK

FIG. 16B

252

31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16
RSVD	RSVD	RSVD	RSVD	RSVD	RSVD	RSVD	RSVD	PATR	PATR	PATR	PATR	PATR	PATR	PATR	PATR

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
PATR	PATR	PATR	PATR	PATR	PATR	PATR	PATR	PATR	PATR	PATR	PATR	PATR	PATR	PATR	PATR

BLINKPATRN

FIG. 16C

254

31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16
RSVD	RSVD	RSVD	RSVD	RSVD	RSVD	RSVD	RSVD	P MASK	P MASK	P MASK	P MASK	P MASK	P MASK	P MASK	P MASK

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
P MASK	P MASK	P MASK	P MASK	P MASK	P MASK	P MASK	P MASK	P MASK	P MASK	P MASK	P MASK	P MASK	P MASK	P MASK	P MASK

PATTERNMASK

FIG. 16D

256

31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16
RSVD	RSVD	RSVD	RSVD	RSVD	RSVD	RSVD	RSVD	BGOFF	BGOFF	BGOFF	BGOFF	BGOFF	BGOFF	BGOFF	BGOFF

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
BGOFF	BGOFF	BGOFF	BGOFF	BGOFF	BGOFF	BGOFF	BGOFF	BGOFF	BGOFF	BGOFF	BGOFF	BGOFF	BGOFF	BGOFF	BGOFF

BG_OFFSET

258 ↗

FIG. 16E

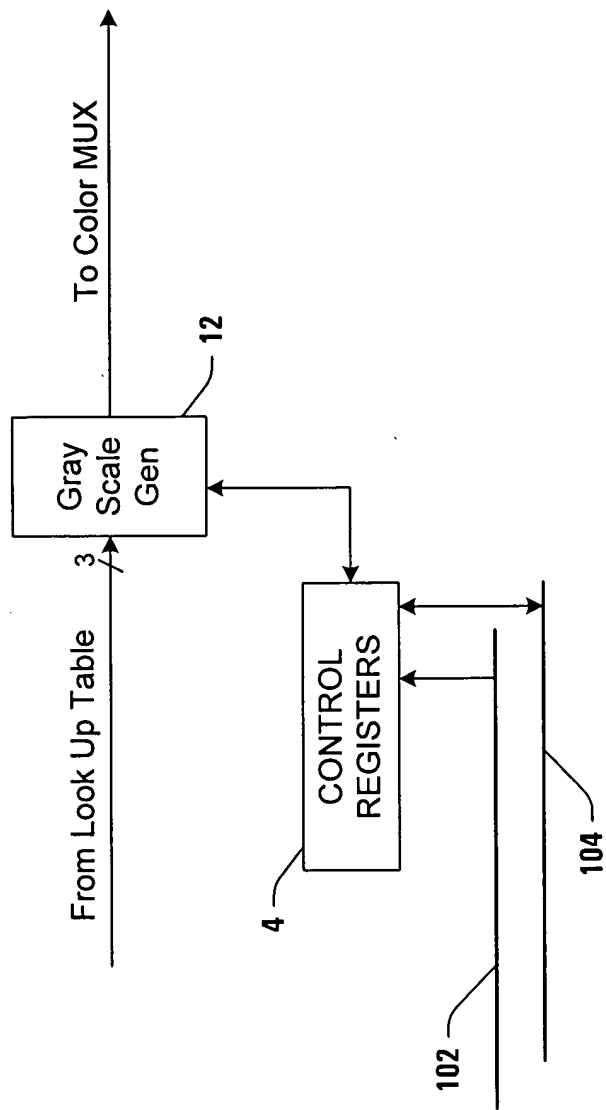


FIG. 17

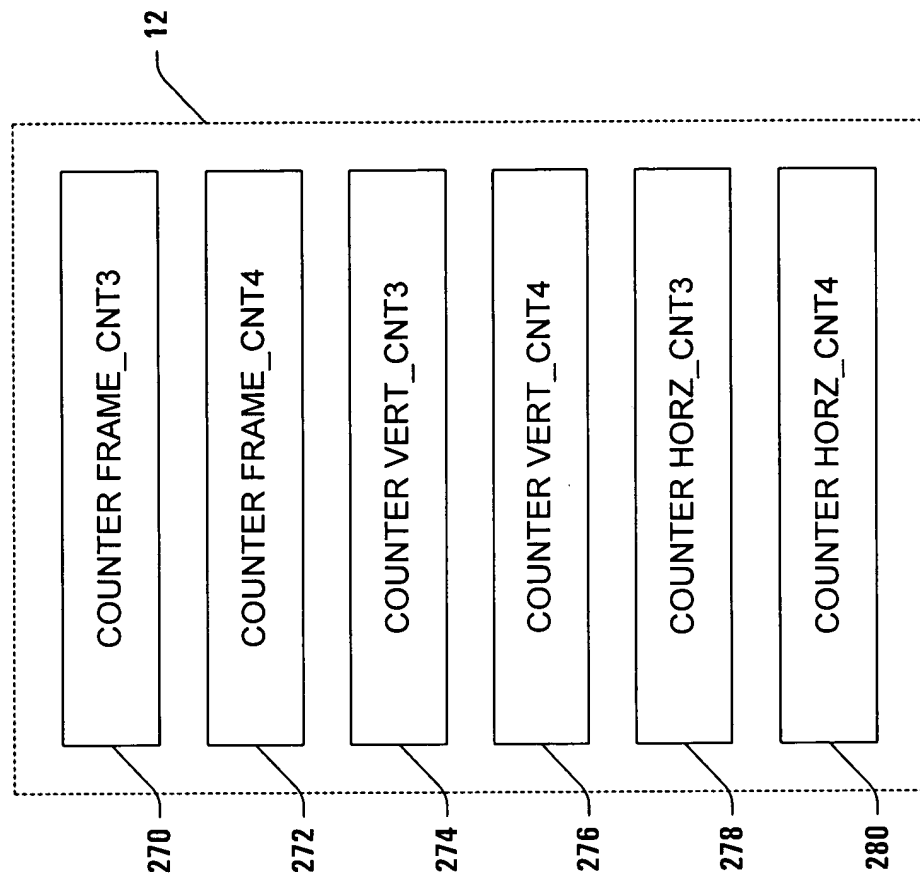
[illegible]

FIG. 18

31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16
RSVD	RSVD	RSVD	RSVD	RSVD	RSVD	RSVD	RSVD	RSVD	RSVD	RSVD	RSVD	RSVD	FRAME	VERT	HORZ

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
D15	D14	D13	D12	D11	D10	D9	D8	D7	D6	D5	D4	D3	D2	D1	D0

GRAYSCALE LUT

FIG. 19

282

300

FIG. 20

FRAME	Vert	Horz	VCNT (lines)	11	11	11	11	11	10	10	10	10	10	10	01	01	01	01	00	00	00	00	00	GSLUT Address *4
Clr	Clr		HCNT (pixels)	11	10	01	00	11	10	01	00	11	10	01	10	01	00	11	10	01	00	11	10	Pixel
D18	D17	D16	register address	015	014	013	012	011	010	009	008	007	006	005	004	003	002	001	000	000	000	000	000	Value
X	X	X	base + 0x80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	00	000
			base + 0xA0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	01	000
			base + 0xC0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	000
			base + 0xE0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11	000
X	X	X	base + 0x9C	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	00	111
			base + 0xBC	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	01	111
			base + 0xDC	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	10	111
			base + 0xFC	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	11	111

302 ↗

FIG. 21

304 →

	H	O	R	Z
V	1	1	1	1
E	1	1	1	1
R	1	1	1	1
T	1	1	1	1

FRAME 1

0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0

1	1	1	1
1	1	1	1
1	1	1	1
1	1	1	1

FRAME 2

FRAME 3

0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0

FIG. 22

306 →

	H	O	R	Z
FRAME 0	1	0	1	0
V	1	0	1	0
E	1	0	1	0
R	1	0	1	0
T	1	0	1	0

FRAME 1

0	1	0	1
0	1	0	1
0	1	0	1
0	1	0	1

FRAME 2

1	0	1	0
1	0	1	0
1	0	1	0
1	0	1	0

FRAME 3

0	1	0	1
0	1	0	1
0	1	0	1
0	1	0	1

FIG. 23

308 →

H O R Z

FRAME 0

V	1	1	0	0
E	1	0	1	0
R	0	0	1	1
T	1	0	1	0

FRAME 1

0	0	1	1
0	1	0	1
1	1	0	0
0	1	0	1

FRAME 2

1	0	1	0
1	1	0	0
1	0	1	0
0	0	1	1

FRAME 3

0	1	0	1
0	0	1	1
0	1	0	1
1	1	0	0

FIG. 24

$$\begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

FIG. 25

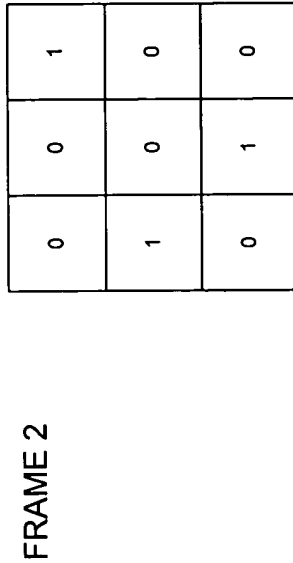
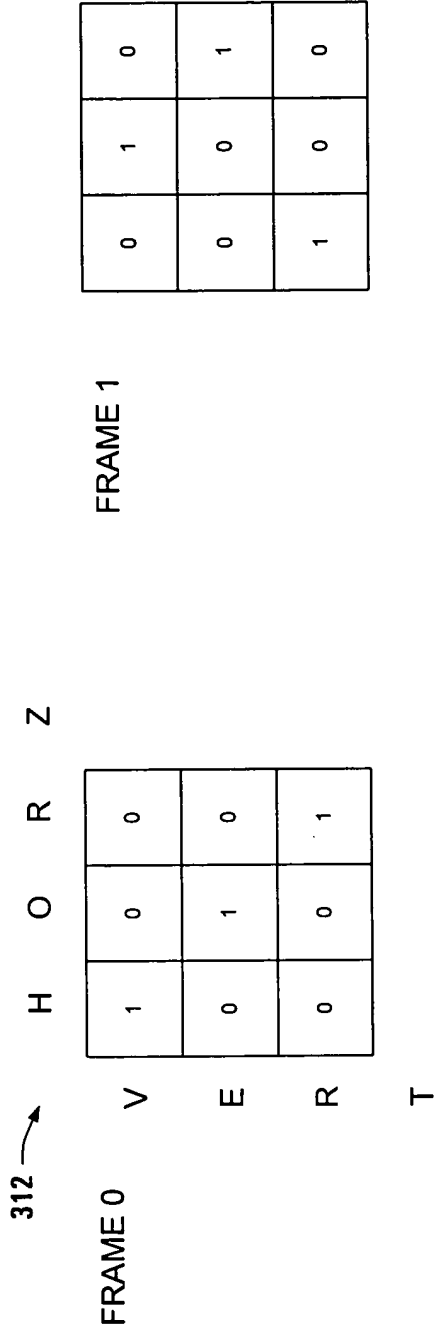


FIG. 26

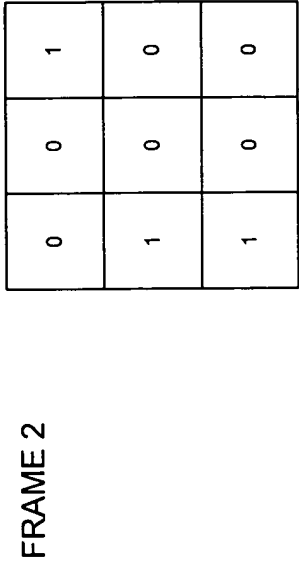
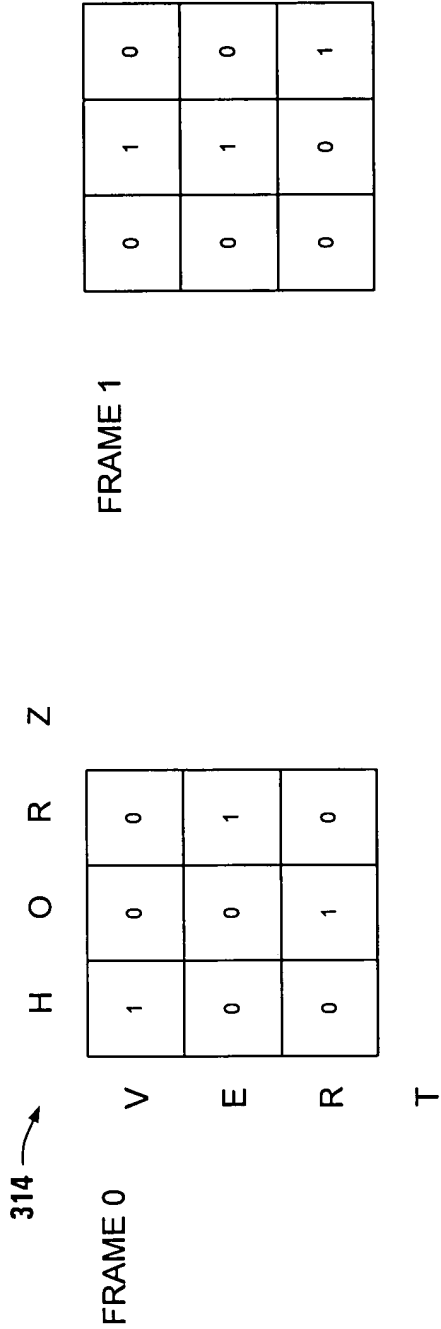


FIG. 27

318 →

H O R Z

FRAME 0

1	0	0	0
0	0	1	1
0	1	0	0

V

E

R

T

FRAME 1

0	1	0	0
0	1	0	0
0	0	1	1

FRAME 2

0	0	1	1
1	0	0	1
1	0	0	0

FIG. 29

[illegible]

FIG. 30

FIG. 30

Display Type	Horizontal Resolution x Vertical Resolution	Video Clock frequency (MHz)	Frame Buffer Storage format	Display Data format	pixels per shift clock	Pixel Shift Clock frequency (MHz)	Vertical Frame Rate (Hz)
VFD	128 x 32	2	4 bpp	monochrome	8	0.25	400
LCD	128 x 64	2	4 bpp	monochrome	4	0.5	230
LCD	256 x 128	2	4 bpp	monochrome	4	0.5	60
"QVGA" TFT LCD	320 x 234	6.4	8 bpp	analog	1	6.4	80
QVGA STN LCD	320 x 240	4	4 bit RGB	4 bit RGB	1	4	50
HVGA STN LCD	640 x 240	8	4 bit RGB	4 bit RGB	1	8	50
"VGA" DC Plasma	640 x 400	16	4 bpp	monochrome	4	4	60
VGA EL	640 x 480	24	4 or 8 bpp	grayscale	8	3	75
VGA STN LCD	640 x 480	24	8 or 16 bpp	18 bit RGB	1	24	75
VGATFT LCD	640 x 480	24	8, 16, or 24 bpp	18 bit RGB	1	24	75
VGA CRT	640 x 480	25.175	8, 16, or 24 bpp	analog	1	NA	70
VGA CRT	640 x 480	32	8, 16, or 24 bpp	analog	1	NA	85
SVGA TFT LCD	800 x 600	40	8, 16, or 24 bpp	18 bit RGB	1	40	80
SVGA CRT	800 x 600	50	8, 16, or 24 bpp	analog	1	NA	85
XGA TFT LCD	1024 x 768	60	8, 16, or 24 bpp	18 bit RGB	2	30	72
XGA CRT	1024 x 768	75	8, 16, or 24 bpp	analog	1	NA	80
SXGA TFT LCD	1280 x 1024	85	8, 16, or 24 bpp	18 or 24 bit RGB	1	85	60
SXGA CRT	1280 x 1024	110	8, 16, or 24 bpp	analog	1	NA	70
SXGAW TFT LCD	1400 x 1024	90	8, 16, or 24 bpp	18 or 24 bit RGB	1	90	60
SXGA+ TFT LCD	1400 x 1050	110	8, 16, or 24 bpp	18 or 24 bit RGB	1	110	70
UXGA TFT LCD	1600 x 1200	135	8, 16, or 24 bpp	18 or 24 bit RGB	1	135	65
UXGA CRT	1600 x 1200	135	8, 16, or 24 bpp	analog	1	NA	60
UXGAW TFT LCD	1900 x 1200	135	8, 16, or 24 bpp	18 or 24 bit RGB	1	135	60
HDTV-2 LCD	1280 x 720	50	8, 16, or 24 bpp	24 bit RGB	1	50	50
HDTV-2 CRT	1280 x 720	66	8, 16, or 24 bpp	analog	1	NA	60
HDTV-4 LCD	1920 x 1080	135	8, 16, or 24 bpp	24 bit RGB	1	135	60
HDTV-4 CRT	1920 x 1080	135	8, 16, or 24 bpp	analog	1	NA	55
QXGA LCD	2048 x 1536	135	4 bpp	monochrome	8	16.875	40
QSXGA LCD	2560 x 2048	135	4 bpp	monochrome	8	16.875	24
QUXGA LCD	3200 x 2400	135	4 bpp	monochrome	8	16.875	17

FIG. 31

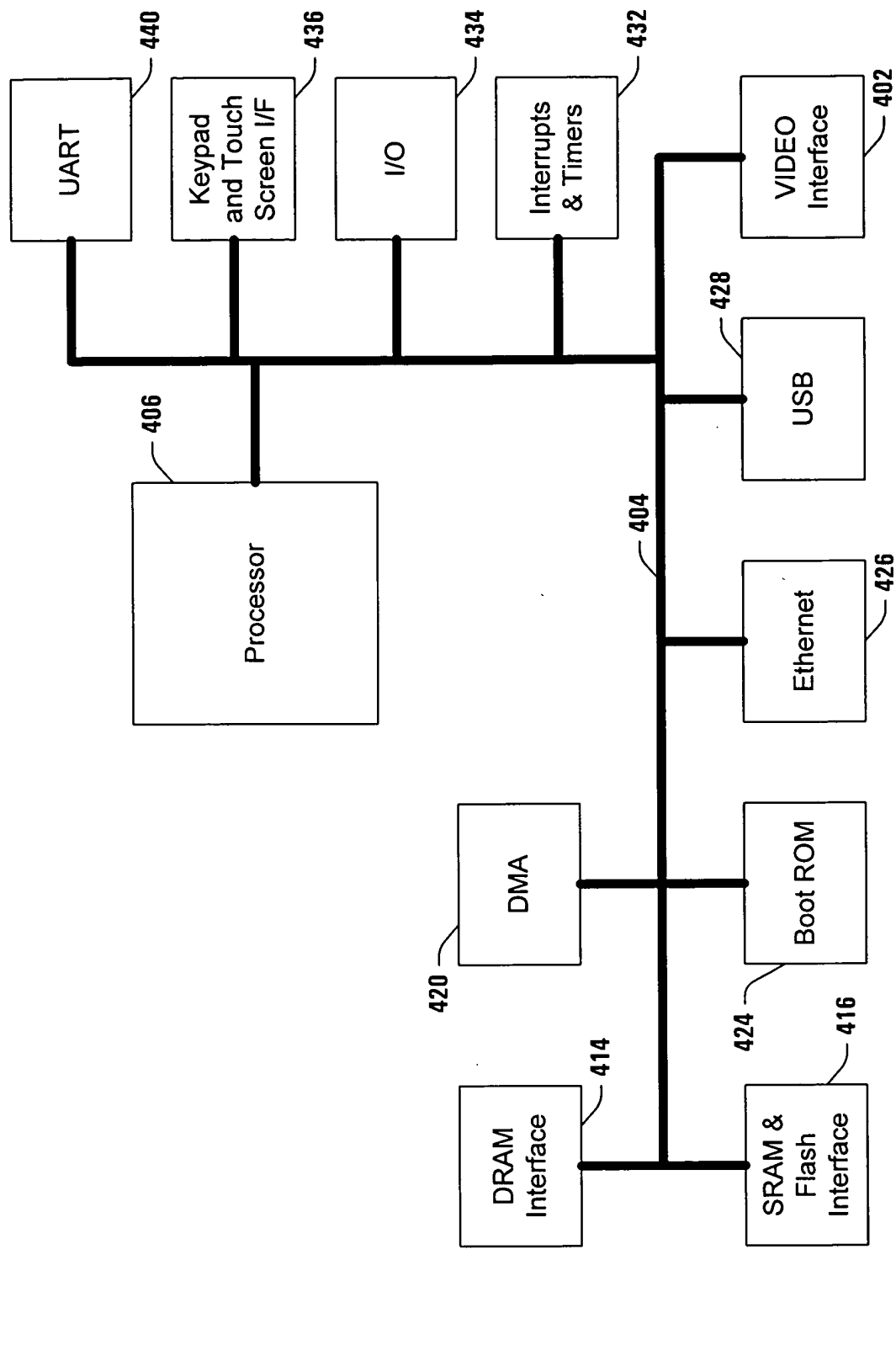


FIG. 32